

Chemistry Laboratory



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Director

The Chemistry Division operates as a service for various divisions within the Department of Agriculture and Food. The division laboratories provide chemical, physical, and microbiological analyses. All samples analyzed in the laboratories are collected and forwarded by various field inspection personnel from the divisions of Plant Industry, Regulatory Service, Animal Health, and Marketing and Conservation Programs.

Feed, fertilizer, meat products, and pesticide formulation are tested for specific ingredients as stated by the associated label guarantee. Some products are also examined for the presence of undesirable materials, such as filth, insects, rodent contamination, adulterants, inferior products, and pesticide residues.

The Dairy Testing Laboratory is responsible for testing grade A raw milk, finished dairy products, and administers an industry laboratory certification program. The laboratory is certified by FDA to perform the following tests: standard plate and coliform counts; microscopic and electric somatic cell determinations; antibiotic residues, and proper pasteurization. The laboratory is also certified as the FDA Central Milk Laboratory for the State of Utah, and our supervisor serves as the State Milk Laboratory Evaluation Officer (LEO) which has jurisdiction over the certified milk labs within the State. The LEO is responsible for on-site evaluation and training of all certified analysts throughout the State and along with the dairy laboratory staff, and administers a yearly proficiency testing program for all industry analysts. The laboratory works closely with the division of Regulatory Services inspectors to ensure safe and wholesome products.

The Meat Laboratory analyzes meat and meat product samples obtained during inspections of plant and processing facilities that conform to Federal and State standards. Tests are performed to measure fat, moisture, protein, sulfites, and added non-meat products to ensure label compliance of these products. Antibiotic residues and cross-contamination from other species are also monitored. We also analyze samples from Montana Department of Agriculture when requested. Samples (meat and carcass swabs) from processing facilities are also tested for the presence of Salmonella on a monthly basis.

The Pesticide Formulation Laboratory's function is testing herbicides, insecticides, rodenticides, and fungicides to ensure that the listing of active ingredients and their concentrations are in compliance with state labeling laws. The Pesticide Residue Laboratory tests for presence and subsequent levels of herbicide, insecticide, rodenticide, and fungicide residues in plants, fruits,

vegetables, soil, water, and milk products. These samples are submitted when inspectors suspect there may be a misuse of the application of the pesticide. Milk samples are tested once a year to for pesticide contamination in accordance with FDA regulations.

Commercial feed (agricultural and pet) samples are tested for moisture, protein, fat, fiber, minerals, toxins, antibiotics, and vitamins in the Feed Laboratory. Seed moisture determinations are also performed for the State Seed Laboratory. The Fertilizer Laboratory tests solid and liquid fertilizer samples for nitrogen, phosphorus, potassium, and trace elements, and heavy metals. All feed and fertilizer results are compared to label guarantees to ensure compliance with state labeling laws.

Special Consumer Complaint Samples are also examined for the presence of undesirable materials such as filth, insects, rodent contamination and adulterations. The samples are checked to verify validity of complaint, and if found positive, the matter is turned over to departmental Compliance Officers for follow up action.

Ground and Surface Waters are monitored for the presence for pesticides, nitrates, heavy metals and other inorganic elements, in addition to other water quality related parameters. This data is combined with other water data collected in the field to provide a picture on the quality of the state aquifers and develop water vulnerability studies.

Significant Events:

The retirement of our feed and fertilizer chemist slowed things down for part of the year while hiring a replacement. This is reflected in the number of feed and fertilizer samples analyzed. We proud to report the new member to the team has adjusted well and things are back on track. We also replaced our technician who is performing well. This year we expanded our capabilities to provide essential ground water quality results through the purchase of a Ion Chromatography system. This will allow us to measure anions so water hardness and total dissolved solids can be calculated. With no extra costs we have also started monitoring the ground water samples for perchlorates. The ICP-MS is also being used to provide mercury and heavy metals results for the ground water samples. The division has increased the number of pathogen tests for the Meat Inspection Division. We are now performing tests on meat products for E. coli and Listeria. No pesticides have been detected in dairy producer samples collected last year and the ground water samples have shown a similar trend.

The Dairy Lab will now be able to test for quality components (protein, fat, water, solids-not-fat, etc.) in dairy products. These tests are mandated by law and we have not had the capabilities to perform the tests. There are no plans to increase FTEs for all the new added water, pathogen, and dairy tests.

We have been converting over to the new data reporting system developed by IT. This will allow for more flexible reporting capabilities and monitoring laboratory performance. We have started the process for obtaining ISO 17025 laboratory certification.

The format of the accompanying table has been changed this year. We are reporting the number of samples and tests for each fiscal year instead of the calendar year. This will provide more meaningful information for the legislature.

The following is a breakdown of the number of samples and analyses performed in the various programs in the Laboratory Services Division for the fiscal years 2003, 2004 and 2005.

| FY | 2003 No.samples | 2003 No. tests | 2004 No. samples | 2004 No. tests | 2005 No. samples | 2005 No. tests |
|---------------------------------|--------------------|-------------------|---------------------|-------------------|---------------------|-------------------|
| Federal Meat | 84 | 327 | 64 | 222 | 91 | 361 |
| State Meat | 547 | 1,123 | 546 | 1,176 | 539 | 1,076 |
| Montana Meat Samples | 17 | 122 | 9 | 83 | 4 | 31 |
| Dairy Microbiology | 3,603 | 9,067 | 3,579 | 9,546 | 3,822 | 9,750 |
| Fertilizer | 189 | 693 | 210 | 767 | 85 | 328 |
| Feed | 424 | 1,375 | 417 | 1,346 | 247 | 647 |
| Pesticide Formulation & Residue | 30 | 35 | 31 | 44 | 30 | 40 |
| Special Samples | 23 | 47 | 19 | 40 | 29 | 34 |
| State Groundwater | 471 | 21,266 | 727 | 32,128 | 839 | 36,617 |
| Milk Pesticide Residue | 273 | 8,190 | 244 | 7,320 | 188 | 5,640 |
| Meat Pathogens | 278 | 278 | 261 | 261 | 221 | 221 |
| TOTAL | 5,939 | 42,523 | 6,107 | 52,933 | 6,095 | 54,745 |

Since the labs have been working toward ISO certification, there has been any increase in the number of quality control tests associated with these determinations.